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ABSTRACT

This retrospective study was done to identify academic and personality variables that predict student progression through an associate degree nursing program and achievement on the National Council Licensing Examination for Registered Nurses (NCLEX-RN). The study searched for evidence of a decline in academic ability in the students over the 7 year (1982-88) span of the study. The study used all records of 190 associate degree level nursing students in a career mobility program. The records were grouped on the progression variable into the categories "withdrew," "failed courses," and "completion." The graduates were then grouped on the NCLEX-RN achievement variable into the categories "passed" or "failed." The entry grade point average was the only variable that demonstrated significance in mean differences in the progression categories. Results indicated that the academic achievement measured by the entry grade point average for an average of 70 credit hours showed no decline in academic ability of the classes over the 7 year period. (JB)

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RELATIONSHIP BETWEEN ACADEMIC VARIABLES AND PERSONALITY TYPE TO PROGRESSION IN AN ASSOCIATE DEGREE NURSING PROGRAM AND ACHIEVEMENT ON NCLEX-RN

By

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THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

Master of Science in Nursing

The University of New Mexico
Albuquerque, New Mexico

December, 1990

HE 025707

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Abstract

THE RELATIONSHIP BETWEEN ACADEMIC VARIABLES AND PERSONALITY TYPE TO PROGRESSION IN AN ASSOCIATE DEGREE NURSING PROGRAM AND ACHIEVEMENT ON NCLEX-RN

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This retrospective study was conducted to identify academic and personality variables that predict student progression through the program and achievement on NCLEX-RN. It also searched for evidence of a decline in academic ability in the students over the seven year (1982-1988) span of the study. It was a population study (N=190) of all records of the associate degree level nursing students in a career mobility program.

Depending on the student's progress following admission, the records were grouped on the progression variable into the categories "withdrew", "failed courses", and "completion". The graduates were than grouped on the NCLEX-RN achievement variable into the categories "passed" or "failed". The retention and pass rate were high, resulting in small numbers in the categories, therefore, nonparametric procedures were used to determine the significance of the independent variables measured on admission. The entry GPA was the only variable that demonstrated significance in mean differences in the progression categories. The entry GPA and reading scores were significant for the NCLEX-RN achievement. Total credit hours were not significant as a

variable. Personality type determined by the Myers-Briggs Type Indicator (MBTI) did not contribute to differences for either dependent variable. Other findings associating type with GPA and career selection were consistent with MBTI Theory. The academic achievement measured by the entry GPA for an average of 70 credit hours showed no decline in academic ability of the classes over the 7 year period.

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CHAPTER 1

INTRODUCTION

In recent years the national media has given attention to nursing by reporting the nationwide nursing shortage, the decline in the number of graduates from nursing programs, and an increase in the failure rate on the National Council Licensing Examination for Registered Nurses (NCLEX-RN). These pronouncements serve as catalysts to mandate that more students be assisted to graduate, however, the students must develop the qualities needed to be successful in the profession.

It is frequently reported that the profession is having difficulty attracting students into nursing education. It is implied that the career opportunities available to women have resulted in a "brain drain" effect for nursing education (Holtzclaw,1983). Potential students are believed to be selecting professions that provide more desirable career opportunities than nursing, thus decreasing the pool of qualified applicants for nursing programs.

In July of 1988 the pass rate on the NCLEX-RN was the lowest in the history of the examination. Nearly half the difference in the pass rate was attributed to differences in the characteristics of the students who selected nursing as a career ("NCLEX: Keeping", 1988). If research supports this decline in student aptitude, nurse educators will have a greater need for reliable predictors of performance in order to identify students with the potential for success. In addition, students predicted to be at-risk for failure can receive early intervention to prevent attrition and aid them in developing and applying their knowledge and skill.

The primary focus of most student assessment is past academic

achievement. This is appropriate since grades predict grades, which predict success in education. In nursing there are students with average academic skills who fail NCLEX; conversely, students who have entered the program with borderline grade point averages (GPAs) have successfully completed the program and passed NCLEX. This inconsistency warrants investigation.

Noncognitive variables are not recognized as reliable predictors, but they do account for more than one-third of the variance in student success (Dell & Valine, 1990). Thus, research of noncognitive variables, such as personality type, which play a role in predicting the progress of nursing students is of interest to educators.

This research investigated the personality preference of students, assessed through the Myers-Briggs Type Indicator (MBTI), and academic indicators to search for variables which may relate to the aptitude needed to progress in nursing education. It is intended to assist nurse educators with identification of student needs for learning experiences that promote their development. The goal is to retain and guide the students to successful completion of the program followed by passing the licensing examination.

Problem Statement

This study described the changes in academic ability of students who enroll in nursing classes and investigated the relationship between academic indicators and student progression in an associate degree nursing program and achievement on NCLEX-RN. It also described personal characteristics of the students who were successful and those who were not.

Questions to be answered by the study included: 1) were there

changes in academic ability in the students? 2) what are the variables that signal which students will successfully progress through nursing education and pass NCLEX-RN? and 3) how can educators best use personality characteristics to determine effective individualized approaches to learning to enhance student progression and achievement?

The resources of nursing education must be managed skillfully to meet the expectations of the profession. Since attrition from nursing programs is very costly, attention to attributes that contribute to successful completion of an academic program and achievement on NCLEX-RN is important.

Purpose

The purpose of this study was to describe differences in the students who enrolled in nursing classes and to examine the relationship between academic variables, personality preferences and the progression of students in associate degree nursing and achievement on NCLEX-RN.

Research Questions

1. Was there a decline in the academic ability of the students who enrolled in nursing classes from 1982-1988?

2. What are the differences in the entry GPA, prior credit hours, and TABE reading scores of students who withdrew, failed, or completed an associate degree nursing program?

3. What are the differences in the entry GPA, prior credit hours and TABE reading scores of students who passed or failed the NCLEX-RN?

4. What is the relationship between personality type and progression in an Associate Degree Nursing Program?

5. What is the relationship between personality type and

achievement on the NCLEX-RN?

Assumption

It can be assumed that there is some homogeneity of students in two-year nursing programs permitting certain generalizations of the findings to programs of similar description.

Limitations

The TABE scores were not available as scale scores. They are reported as grade equivalent scores, not true interval data which would reduce the power of the test of significance. Due to the existence of minimum admission scores, the range of TABE scores was restricted.

Definitions of Terms

1. Admission to Level II--a student admitted to the program is a graduate of a practical nursing (PN) program.

2. Progression--this variable is a categorical measure that includes students who:

   a. withdraw, leave the program prior to graduation.

   b. fail, terminate from the program due to a course grade below C in the nursing major.

   c. complete, obtain an associate degree.

3. NCLEX-RN this variable is dichotomous and includes categories of graduates who:

   a. fail NCLEX-RN, as a first time exam writer.

   b. pass NCLEX-RN, as a first time exam writer.

4. Entry GPA (EGPA)--grade point average for courses completed prior to admission to courses in the nursing major at the ADN level. It is based on a 0 to 4 point system.

5. Credit hours-(CRHR) total hours earned prior to enrolling in

the nursing major.

6. Tests of Adult Basic Education (TABE)--standardized exams that measure competence of adult learners. Scores are reported as grade equivalent scores.

7. Myers-Briggs Type Indicator (MBTI)--a self-report, forced choice personality questionnaire that yields scores on four dichotomous scales. In this study MBTI and type are synonymous terms.

CHAPTER 2

LITERATURE REVIEW

As the nursing shortage is fueled by changes affecting nursing education, what factors will nursing educators consider in resolving this dilemma? The answers are sought by investigating the applicant pool and licensure examination pass rate and associating the findings with student academic and personality variables. Composite student profiles point the way to interventions to enhance student development to achieve success in program completion and licensure by examination. This review will present research on nursing shortage issues; it will investigate personality characteristics and academic variables that predict success, forecast achievement and target need of advisement for retention and remediation.

Changes Affecting Supply

The results of the NLN 1988 annual survey of schools preparing registered nurses (RN) show that the number of graduates has declined for the third year in a row. The total number of RN programs peaked in 1984 and has since declined by 2.4 percent (Rosenfeld, 1990). This is disturbing information for those impacted by the shortage of nurses.

Applicant Pool:

Due to changing demographics there is an "enrollment crisis" in higher education. For nursing there is the additional problem of declining interest in the profession.

Deback (1989) urged educators to recognize that society has experienced a shift of values. Altruism has yielded to financial productivity, and this has had a negative impact on the health care system. As fewer people show interest in these professions, the demand

for nurses will continue to exceed the supply.

In the fall of 1986, freshmen women in four-year institutions who hoped to pursue careers in nursing numbered 19,000, down from 42,200 in 1983. The ratio of women aspiring to be nurses compared to those planning to be physicians was 0.8:1 in 1986, down from 3:1 in 1968. These figures reported by Green (1987) were data from 21 annual surveys of college freshmen, a project sponsored by the American Council on Education and the University of California in Los Angeles.

Women who were formerly channeled to nursing through social expectations of sex-typed roles are now entering high-ranking professions formerly occupied exclusively by men (Holtzclaw, 1983). "Indicators suggest that the most intellectually capable women are pursuing other professions such as business, medicine, pharmacy, and computer science" (Farrell, 1983 p. 145). In 1986, one-third more nonnurses than nurses reported having A or A- grade-point averages in high school, whereas, about one-third more nurses than nonnurses had grade averages of C+ or C (Green, 1987, p. 283).

Conclusions based on recent NLN studies indicated "...shrinking applicant pools are forcing programs to lower admission standards and to offer large doses of remediation to the students they accept" (Rosenfeld, 1987, p. 283). This conclusion bears questioning since the survey asked if remediation was available. The majority of programs reported that remediation in mathematics, reading and study skills was available. This seemed to indicate it is a service provided by the institution for all students and not implemented due to nursing student deficiencies. This concept is supported by the work of Harold Hodgkinson (1985) who said 80% of the post secondary institutions now

offer remediation.

Carol Lindeman ("Nurses future", 1987) responded to Green's research in the American Journal of Nursing (AJN), saying "The grade point average of our students is comparable to those going into medicine. The best and the brightest are not just going into other fields" (p. 1613).

Differing conclusions are also reflected in the reports of the 1985 Scholastic Aptitude Tests (SAT) which have shown that fewer numbers of students are considering nursing and that SAT scores of prospective nursing students are considerably lower than other college students. The 1985 SAT data are reported by the American Journal of Nursing ("Educ. worried", 1986) and Farrell (1986), but there is more than a 100-point discrepancy in the figures reported. This raises concern that the data are subject to varied interpretations.

Another perspective of declining nursing student ability is put forth in Issues. It is based on the mean Rasch ability level drawn from historical statistics of licensing examination results. The publication explained that this measure was used since no other general ability data is collected on NCLEX candidates. The Rasch scale generated data about the test items and the candidates who took the test (Howard, 1985). It incorporated the performance of each person and of test items on the same scale. The test items have a difficulty value and the candidates have an ability estimate. Using this measure, the ability estimate of candidates is reported to be declining ("NCLEX: Keeping", 1988).

NCLEX:

The National Council of State Boards of Nursing (NCSBN) is the independent organization responsible for the licensing examination for

the nursing profession. In 1987, the delegate assembly accepted a major change in the test plan and scoring process ("Ninth Annual," 1987). The July 1988 examination incorporated the new passing standard and test plan; this resulted in an 83.6% pass rate, down from 91% in July 1987. Factoring the examination on previous standards implies the pass rate would have been 87.5%, a 3.5% increase. The remaining half of the decline was reportedly due to changes in the test plan and in the ability of the students. ("NCLEX: Keeping", 1988). Media attention focused on the issue that one in six test takers failed the licensing examination. They also reported the drop in pass rate was due to the decline in student ability. In a bulletin dated September 23, 1988, Wayne Chamberlain, NCSBN Director of Information Service, explained that two major reasons for the lower pass rate were the test plan modification and declining ability. According to Chamberlain, "...an evaluation of the performance in the July 1988 examination revealed that the average ability level for U.S. educated nurses taking the examination for the first time was substantially lower than it was for previous July administrations".

Student Characteristics

Academic history as well as personal characteristics provide data on students that is useful to nursing educators. There is extensive research on academic variables, less on personal characteristics.

Personal Characteristics:

There is growing interest in researching the personality characteristics of students to investigate the variance in performance not addressed by cognitive factors. The MBTI has been used to identify personality types. The essence of the MBTI theory is that variations

in behavior which seem random are actually consistent and orderly. The indicator reports the differences in the way people prefer to use their perception and judgment. The MBTI reports four bipolar preferences: Extraversion-Introversion (E-I), Sensing-Intuition (S-N), Thinking-Feeling (T-F), and Judging-Perceiving (J-P). The student's personality type is identified by four letters which represent each individual's preferences. There are 16 possible four-letter designations--ESFJ, ENFJ, ISTJ, INTJ, etc. (Myers & McCaulley, 1985).

The E-I scale is presumed to measure a person's orientation to the world. Extraverts orient to the outer world and the measure is of their interest in things and people. Introverts orient to the inner world and the scale measures their interest in concept and ideas. The S-N scale measures tendencies to perceive through the process of sensing, reporting observations from one or more of the five senses, or the less obvious process of intuition, the indirect unconscious process that reports meanings and possibilities which are worked out beyond the reach of the conscious mind. The T-F scale measures tendencies to judge or evaluate phenomena rationally and impersonally, or subjectively and personally. The J-P scale measures the style of dealing with the outside world. Those with a perceptive attitude project behavior that is spontaneous, curious, adaptable, and open to new events and change. A judging attitude characterizes a person whose behavior is organized, purposeful and decisive (Myers & McCaulley 1985).

Noncognitive variables were not found to be good predictors of success on examinations, but study is warranted to investigate the large percentages of variance that has not been explained. Brown (1981) in a study of BSN students found 82% of the variability in clinical nursing

was not explained by intellectual factors. She did find the extraversion-introversion scale of the MBTI was significant in predicting 1.8% of the variability of the clinical GPA. The students who had higher extraversion scores had higher GPA's.

MBTI theory indicates many of the students attracted to nursing would more than likely be the sensing-feeling (SF) personality types (Batten, 1982; Brown, 1981). The same groups are not expected to be the personality types which have high SAT scores. Schuer & Ruble's (1988) study of academic achievement and retention for 2,906 freshmen reported students with marginal preparation seemed to be able to be successful when they entered a major consistent with their personality type.

MBTI theory reveals that occupations attract particular types. Myers & McCaulley (1985) found that people are more likely to change their work environment to match their type than change their type to match their work. The perception and judgment preferences of students attracted to nursing could be contributing factors in observations reported by Green and Rosenfeld. Green (1987) believes the difference between nurses and nonnurses is that "Nurses seem to have fairly well defined career choices and seem to be strongly committed to those choices" (p. 254). Also, fewer nurses than nonnurses anticipated a change in their majors. Rosenfeld (1988), reporting on retention of enrollment, stated, "Compared to general attrition rates at institutions of higher learning, nursing has a remarkably strong and high net retention rate" (p. 200).

Schuer & Ruble's (1988) research with the MBTI demonstrated that post-secondary achievement was an important factor in retention. Similar work by Anchors, Robbins & Gershman (1989) found a relationship

between personality type and students' persistence in their post-secondary education. The Anchors' study also identified a relationship between type and GPA, which supports earlier reports by Myers & McCaulley (1985) who wrote, "The trends...continue with Is scoring somewhat higher than Es, Ns higher than Ss, Ts and Fs with no clear pattern, and Js receiving higher grades than Ps" (p. 104).

Judith Provost (1985) collected MBTI data from an entire entering class to determine which types are more or less persistent at that college. She found those most likely to leave were ISTP, ESTP, ISFP, and ENFJ. The ENFJs had high standards and often left to find a better environment "fit". The other three groups could be described as less organized, more passive, and with a preference for discovering the world with their senses in a flexible, unstructured way. Those three also had the lowest GPA's. The highest GPA's all had judgment preferences. The broadest implication of this research is the need for early intervention. The at-risk groups need help with goal-setting and study skills. Faculty and students who are aware of preference and differences can enhance teacher/learner interactions.

Merritt (1989), in a report to NLN on learning styles, included the MBTI as one of the few models with a theory base. For the report, the MBTI was classified as a cognitive personality model and described as having possibly "...the most pervasive dimensions that determine how people approach learning" (p. 12). Similar acknowledgment of the MBTI relationship to learning style was reported by Partridge (1983). A synthesis of studies reported the learning styles were clearly consistent with the MBTI theory (Lawrence, 1984).

Research with ADN students reported by Cranston (1985), addressed

cognitive style and learning style. The results were inconclusive except to cite the advantage that by using an instrument which provides learner data, teachers become more aware of each student as an individual learner.

Other research on the MBTI and learning comes from O'Hear (1989) whose findings suggested personality types as determined by the MBTI do have a bearing on the way a person reads. For instance, it was discovered that SJ groups read very carefully while NF groups tend to skim the text. Educators could use this research to gain insight into specific styles of reading for students. Nursing students with weak reading skills could quickly be overwhelmed by the demanding reading schedule.

Academic Variables

Academic variables discussed in this section will include the Tests of Adult Basic Education (TABE) and the grade-point average (GPA). An extensive research project of newly licensed nurses conducted by NLN reported that "the graduates of ADN programs differ dramatically from their BSN and diploma counterparts on several demographic features" (Rosenfeld, 1989, p. 130). The differences included the ADNs' being older, married, and having children at home which possibly affect their educational endeavors.

Associate degree nursing students would fit the category of adult students, or nontraditional students. Students in this group seldom have comparable criteria which represent their academic skills. For instance, the scores from American College Testing (ACT) have an age bias against older students (Aldag & Rose, 1983). An equitable measure of current ability in reading, mathematics and language skill is

provided by using the TABE.

A study by Farr, Moon, & Williams (1986) indicated that TABE is an acceptable diagnostic/prescriptive instrument that effectively predicts performance on General Education Development(GED) tests . The GED is a minimum requirement for admission to nursing programs for students who are not high school graduates.

The TABE used as a health occupations entrance requirement was reported in a study by Kittner (1982) and one by the Kentucky State Department of Education (KSDE) (1988). In the KSDE study, the TABE was not found to be a significant predictor of program completion. A secondary source reported that there was a positive correlation between TABE and program completion in the Kittner study.

Many studies have been conducted using the GPA and NCLEX-RN as variables. Grant (1986) consolidated early nursing education research and noted that GPA was the most commonly used criteria for predicting achievement in the nursing major. The licensing examination changed form in 1982 from the norm referenced State Board Test Pool Examination (SBTPE) to the criterion referenced National Council Licensing Examination (NCLEX) ("Convention Report", 1980). Due to the change in the examination, this literature review will be restricted to information applicable to nursing education from 1982 to the present.

Collegiate GPA accounted for the majority of the variance in NCLEX scores in a BSN study reported by Dell & Valine (1990). The learning inherent in attaining the higher GPA increased the performance on NCLEX. In this study the GPA accounted for 58% of the variance. Seven other BSN studies found an entry GPA to be one of the significant variables in predicting performance. (Allen, Higgs, Holloway, 1988; Bauwen & Gerhart,

1987; Glick, McClelland, and Yang, 1986; Jenks, Selekman, Bross, and Paquet, 1989; Payne & Duffy, 1988; Quick, Krupa, Whitley, 1985; Wold & Worth, 1990).

McKenney, Small, O'Dell and Coonrod (1988) reported the predictors that most accurately indicated scores on NCLEX as GPA, SAT verbal, Mosby Assesstest, and nursing theory GPA. An additional factor was proposed by Whitley and Chadwick (1986). They reported that low SAT scores, low science and cumulative GPA's that drifted downward indicated a significantly high risk of failing on NCLEX.

Research with students of a diploma nursing program by Crane, Wright, and Michael (1987) produced results similar to BSN studies. The nursing GPA appeared to be the most valid predictor of success on NCLEX, whereas, high school GPA provided little predictive validity of achievement in nursing.

Studies with Associate Degree Nursing students produced the following results. Felts (1986) indicated that support courses GPA accounted for 46% of variance in the nursing courses GPA and that performance in college courses predicated pass/fail status on NCLEX with greater accuracy than high school performance. Lengacher and Keller (1990) found the best predictors of performance on NCLEX to be the exit GPA and ACT composite scores and the entrance GPA correlated with the exit GPA. In contrast to the Lengacher report, Souder-Dixon (1985) reported no significant variance predicted by ACT scores, but did report that the college GPA alone accounted for 64 percent of the variance in predicting NCLEX performance. Woodham and Taube (1986) in a study of 107 ADN students, concluded from a sample of 10 ADNs that outstanding achievement in the program predicated outstanding NCLEX performance.

Some contrast in the prediction of success by GPA was expressed by Boyles (1986, p. 15) in a study of minority students. She found that the entering GPA did not predict who the program dropouts would be. Research by Tucker-Allen (1989) that indicated a significant number of minority students fail to graduate. She stated that for 1983, 10.6% of nursing school admissions were minority students, but only 8.88% completed the program. In 1984-1985 data reported by the American Nurses' Association (ANA), 12.7% of the admissions were minorities with 9.5% of them graduating. This information represented 1,260 programs ("Facts about", 1987).

Reporting on black students in a BSN program, Dell and Halpin (1984) found predictors for black graduates seemed to be the same as for other ethnic groups when using high school GPA, SAT scores and NLN Pre-Nursing Examinations. They reported each variable significantly differentiated between graduate and nongraduates.

As the pool of applicants for nursing decreases, there is an increasing investigation into of variables which will predict the minimum standards that lead to success in nursing. A study of BSN programs revealed that 52% of the schools required a GPA of 2.5., while 27% required a 2.0. The most frequent reason given for raising requirements was that students admitted with GPA's below 2.5 were more likely to be unsuccessful (Grubbs, 1989). Another BSN study (Allen, Higgs, Holloway, 1988) that reinforces the usefulness of the GPA as a predictor of success also found it could identify the at-risk students. Questionable GPA's required differentiation between inadmissible students and those with potential. Grade-related variances that indicated students were at risk for failure in nursing course work were

a history of two or more "D" grades and two or more withdrawals from college course work. In addition, the study reflects that students who earned a large number of college credits without earning a degree were also at risk for failing nursing. The same outcome was predicted for students with low scores on verbal fluency.

An interesting credit hour correlation was reported in Milliken's (1986) study of ADN students. A group with 60 or more credits had a failure rate of 30%. This was the highest failure rate for any category of students with previous credit. The 16-30 credit category had a 6% failure rate--the lowest of any category.

A study from a Vermont College, apparently an ADN program, analyzed the relationship between the first-semester GPA and licensure examinations, while the study indicated that a GPA below 1.50 predicted students would fail their licensure examinations. A GPA of 2.7 would predict passing boards at a 95% level of confidence (St. Thomas, 1982).

Outcomes from a study that precedes the 1982 parameter for this report is included because the MBTI was used in the prediction variables. The study indicated a low GPA may warrant the use of the MBTI since personality measures could be given to individuals for whom other predictors yield inconclusive results. For example, in the study of 146 students, 37 left the program, 22 of those were within one standard deviation above or below the mean of one of the predictor variables (Wittmeyer, Camiscioni, Purdy, 1971). A study reported by Woodham & Taube (1986) shows "...there is no evidence that higher SAT scores predicted greater achievement within the nursing program" (p. 123). Students with marginal academic preparation may be successful in majors that are consistent with personality type, an idea supported by

Schuer & Ruble (1987). Batten (1982) reported that the affinity of SF types for nursing make up for their lack of scholarship. She also reported the feeling trait preference has the highest retention rate--89.2%, and that groups like ESTP and ESFP should be successful in an ADN program with its social, people-oriented content, but they are underrepresented. Bakers' (1983) study of personality type and ADN's did not show that personality type was associated with academic achievement.

Advisement Issues:

An increasing number of reports include suggestions for promoting the success of students by heeding the predictors and avoiding student failure. Payne and Duffy (1986) stated, "Special efforts at this time to maximize the performance of students who enter nursing, without sacrificing the quality of performance, seem to be a worthwhile area of investigation" (p. 331).

Anticipating changes in the quantity and quality of applicants to nursing programs, Allen, Higgs, & Holloway's (1988) research--a previously cited study--resulted in a useful plan for action. The research reported that instructors are urged to develop an at-risk profile to identify students who are likely to have academic difficulty. The students who are admitted should have potential for success, but could require programs of support. Anticipatory guidance for students by advisors would be to follow the initial assessment with referrals to assistance and resources. It is reported that use of data to assist students to succeed will enable programs to reduce the cost and increase the benefit of accepting at-risk students.

Computer Assisted Instruction (CAI), introduced as a new strategy

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in an existing medical surgical course, was believed to be a contributing factor for the increased scores on the NLN Medical-Surgical Examination. The strategy was implemented to improve the academic performance of minority and disadvantaged students. These students, if given appropriate support, could be successful in completing their academic program, (Goodman, Blake, & Lott, 1990). This strategy gains significance when coupled with the prediction by Hodgkinson (1985), that around the year 2000, America will be a nation in which one of every three persons will be nonwhite. The population coming through the educational system is predicted to be poorer, more ethnically and linguistically diverse and bridled with an increased number with learning handicaps.

Ethical implications arise for faculty when admitting the "high-risk" student. The faculty's first ethical responsibility is to identify the students and implement strategies which decrease attrition (such as increasing their academic skills and coping mechanisms followed by on-going analysis of interventions to improve retention) (Donovan, 1989). A nursing faculty advisory project designed for meeting needs of students experiencing academic difficulty was reported to make a significant impact on student success in the program reported by Reed and Hudepohl (1983). The attrition rate declined from 20% to 13% and the number of freshmen failing courses dropped by 50% from the previous year in a program that implemented a project to retain freshmen at the University of San Francisco School of Nursing (Cameron-Buccheri & Trygstad, 1989).

Summary

The literature reviewed focused on studies related to characteristics of nursing students, their abilities, choices, accomplishments and progression. It seems clear that change in demographics is certain, but the change in the ability of students interested in nursing is subject to further investigation. The academic variables are seen as reliable predictors of student performance, while personal characteristics are more likely to describe behavior patterns. The focus of much of the research has been to identify students at risk for problems while other studies addressed predictors of success in nursing program.

CHAPTER 3

METHODOLOGY

This retrospective research study used a survey design for the purpose of investigating academic and personal characteristics of nursing student to identify variables that may influence continued enrollment, passing courses, completing the degree and passing the NCLEX-RN examination on the first attempt. In addition, the students entering nursing classes were examined for evidence of declining academic ability.

Sample

The records of all associate degree nursing students admitted to a career mobility nursing program located at a rural university branch campus were used as the population sample for this study. Data collected from the records represented 190 students who had been admitted to the program from 1982 through 1988. This is the only nursing program in a 100 mile radius and one of 13 ADN programs in the state.

Instrumentation

Data collected from the student records for this research included demographic information, academic history (which included entry GPA, total prior credit hours, and TABE reading scores) and NCLEX results reported as pass/fail.

Personality traits predicted by the Myers-Briggs Type Indicator were collected and reported by type. Following admission, the progress of students was reported as withdrawal, failure of a course in the nursing major, or completion of the program.

Tests of Adult Basic Education (TABE)

The Tests of Adult Basic Education (TABE) are a battery of tests with national norms that measure mathematics, reading, and language competence. The scores are reported as grade equivalents. This battery of tests was selected because assistance with remedial activity was available for students who wished to study and retest. The university has an open admissions policy and students who may not have had experience in formal education for a number of years cannot effectively use SAT scores as a reflection of their basic competence. The TABE was selected as a more appropriate measure of a student's current competence. The examinations are administered by the professional staff in the Adult Education Center throughout the year. The scores are recorded in the student's admission folder and are required for admission into the program.

Grade Point Average (GPA)

The grade point average (GPA) reported on the student record is based on a 4.0 system. Each credit hour with a grade of "A" receives four points; a "B" receives three points; a "C" receives two points; a "D" receives one point. Credit hours are recorded on the semester hour basis.

For this research the GPA was reported as the entry GPA (EGPA) on admission to the nursing major at the associate degree level. The GPA is a widely used and accepted standard of a student's academic achievement.

Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI) was used in this study as a measure of psychological type from the theory of C. J. Jung. The MBTI is a self-reported, forced-choice personality inventory. The F and G

forms of the instrument were used. Myers & McCaulley (1985) reported that "when scored for type, the 1977 Form F and Form G are essentially interchangeable" (p. 144). Form F consists of 166 items, form G has 90 items. The reliability of internal consistency estimated by coefficient alpha is determined from split half-scores, which are at acceptable levels. "The estimates of internal consistency reliability for the continuous scores of the four MBTI scales are acceptable for most adult samples" (Myers & McCaulley, 1985, p. 169). The manual (1986) presents four studies with a range of coefficients from .70 to .84 for a total N = 10,796. Test-retest reliabilities of the MBTI show consistency over time. Tables of test-retest reliability estimates present the range of coefficients from .49 to .93 for a total N = 800. Subjects that report a change in type usually have low scores on their original preference scale (McCaulley, 1985, p. 171). There has been considerable research using the MBTI with health professionals. The program selected the MBTI as a valid and reliable measure of student characteristics useful in advising and counseling.

NCLEX:

The National Council Licensure Examination (NCLEX) is a criterion referenced exam that has received complex statistical assessment which is reported to the member boards along with the examination results. The content validity was established by a job analysis that preceded the test plan development. Additionally, the Angoff method that uses a panel of judges provided validation of content. A communication from NCSBN to member boards (Sept. 1988) reported that "In fact, the reliability index for the current sample population is .99. Previous reliability indices ranged from .86 to .89".

The NCLEX-RN statistical report gives details for each examination. The July 1989 report indicated there were 300 actual items which determined candidate performance. The measure of internal consistency of the items on the test was the Kuder-Richardson KR-20 reliability factor reported as .88. This factor measures how well a candidate's success on one question correlates with success on others; it seems highly related items produce high reliability.

The mean difficulty of the July 1988 NCLEX was reported as "mean p-value .71, mean Rasch difficulty -1.12". This statistic is based on the performance of first-time writers. It is the average (across items) of the proportion of the candidates answering each item correctly. The advantage of the mean Rasch difficulty, or mean difficulty, is that its calculation is free from dependence on the abilities of the particular group of candidates taking the examination. The Rasch difficulty index for NCLEX items ranges between -3.00 (very easy) to +1.00 (quite difficult).

The purpose of the NCLEX is to discriminate between candidates who are competent to practice and those who are not. The statistic used to represent item discrimination is the point-biserial correlation coefficient. The mean point-biserial for July 1989 was .15.

The ability estimates for the NCLEX are obtained by applying the Rasch Item Response Mode. The entry-level nursing competence of the candidates taking the July 1989 exam was a mean of -0.07. These estimates can range between -4.00 (very low ability) to +4.00 (very high ability). The standard error of ability estimate is given and two-thirds of the score would be standard error of the original estimate. If candidates were retested with the same exam this would

estimate the amount of variation expected in the mean ability estimate.

Human Rights

Data for this retrospective study was gathered from student files stored in the Nursing Office. The data was accumulated as part of the on going educational process. The subjects in the study were maintained by code known only to the researcher. This process was planned to prevent invasion of privacy. Consent by the subjects was not possible since the study involved records dating back to 1982. The proposal was submitted to and approved by the Human Subjects Review Committee at the College of Nursing.

Procedures

The data for this retrospective study was available in its natural state in the nursing office. The provost, dean of instruction, director of admissions, director of adult education, nursing faculty, staff and students were informed of the study and offered their support for the project.

Data collection and computer entry were done by the primary researcher, therefore, training for data collection and processing were not required for the research. The researcher, as a nursing faculty member, was given access to the student's records. Collected data was entered into a database management system without grouping the data and with minimum coding. Numerical coding of data was carried out when data was entered into the Statistical Analysis System (SAS) for processing.

Data Analysis

The small numbers in the categories of the dependent variables indicated that distribution-free methods of analysis were warranted. The Statistical Analysis System (SAS) computer program was used to carry

out nonparametric analysis of the data.

The Selection Ratio Type Table (SRTT) computer program was used to group the type data. This program is useful in reporting retention ratios, dropout rates, and other comparisons. The index computed is the ratio of observed frequency to expected frequency, or the percentage of type in the sample divided by the percentage of the type in the base population. When the ratio is greater than 1.00 there are more people in the cell of the table than expected from the numbers in the base population. If the index or ratio is less than 1.00, there are fewer in that cell than expected. The (SRTT) program notes results that are significant and the level of significance is reported.

CHAPTER 4

RESULTS

In this chapter a description of the population will be presented and findings will be discussed as responses to the questions. Nonparametic analysis using Kruskal-Wallis statistics was carried out. The results for each dependent variable are usually reflected in separate tables identified as "Progression" and "NCLEX-RN Achievement".

Description of the Population

The population consisted of 190 records representing all of the students admitted to the second level of an associate degree nursing program from the fall 1982 through 1988. Table 1 represents the progression and achievement of those students. Of the 190 admissions, eight (4.2%) withdrew and 13 (6.8%) failed courses that terminated their progress in the nursing program. There were 169 graduates who wrote the NCLEX-RN with a pass rate for 87.6%.

Gender, age, and ethnicity (Tables 2 and 3, Appendix A), provided additional description of the population. Of the total population, nine (4.7%) were men, none of whom withdrew or failed courses that terminated their progression. Of the 21 graduates who failed NCLEX-RN, three (14.3%) were male. Thirty-three percent of the males failed the examination in comparison to a 11% failure rate for females.

The age of students ranged from 19 to 60 years. Forty-six percent of those who failed courses were under the age of 24, as were 33% of those who failed NCLEX-RN (Table 3, Appendix A). Sixteen percent of the admissions were ethnic minority students. The completion rate (89%) was the same for anglo, black and hispanic students. This consistency was not evident in the NCLEX-RN pass rate which was 92% for anglos, 81% for

TABLE 1
Associate degree nursing admissions: 1982-1988

Students in progression categories		
Categories	N	%
Withdrew	8	4.2
Failed courses	13	6.8
Completed	169	88.9
Totals	190	100%

Graduates by NCLEX-RN Achievement		
Categories	N	%
Fail	21	12.4
Pass	148	87.6
Totals	169	100.0%

blacks, 38% for hispanics and 33% for others. This means only one-third of the ethnic minority students achieved licensure.

Research Questions

Question 1: Was there a decline in the academic ability of the students who enrolled in nursing classes from 1982 to 1988?

The class admitted in 1983 had the lowest mean entry GPA (EGPA) 2.907, SD 0.380, whereas, those students admitted in 1988 had the highest EGPA 3.368, SD 0.419 (Tables 5 and 6, Appendix A). The entry GPA, as a measure of academic ability for credit hours that averaged 70 or more, increased from 1983 through 1986. It dropped slightly (0.079) in 1987 but increased to its highest level in 1988. Clearly it cannot be said that there was a decline in academic ability for this population.

Question 2: What are the differences in the entry GPA's, prior credit hours, and reading scores of students who withdrew, failed, or completed the associate degree nursing program?

The Kruskal-Wallis analysis, using a chi-square distribution, resulted in significant differences in the entry GPA between the groups that withdrew, failed or completed (X^2=10.256, df 2, p=.0059). The results for the other two variables, CRHR (X^2=4.0268, df 2, p=.1335) and READ (X^2=1.1410, df 2, p=.5653) were not significant. The group that completed had the highest GPA and credit hour means, whereas the lowest means were for the group that failed. Those who withdrew had the highest mean reading score, those who failed had the lowest (Table 17, Appendix A).

Question 3. What are the differences in the entry GPA, prior credit hours and reading scores of students who pass or fail the

NCLEX-RN?

The Kruskal-Wallis analysis of the NCLEX-RN achievement categories using the chi-square distribution resulted in significant differences between the groups' entry GPA and reading scores: EGPA (X^2=10.958, df 1, p=.0009), and READ (X^2=24.014, df 1, p=.0001). The total credit hour variable was not significant, CRHR (X^2=1.0117, df 1, p=.3145). The group that failed the NCLEX-RN had the lowest means for all three of the variables.

Question 4: What is the relationship between personality type and progression in an associate degree program?

Personality types of the students are represented in Tables 7 and 8, Appendix A. There is only one INTJ. Four other types had less than five students: ISTP (4), INTP (2), ESTP (3), and ENTP (3). Five types represented 63% (120) of the students, they were ISTJ (18), ISFJ (32), ESTJ (22), ESFJ (29) and ENFJ (19).

The progression categories were analyzed using the Selection Ratio Type Tables (SRTT) (Tables 1, 2, and 3, Appendix B). The three categories "withdrew", "failed" and "completed" were run as dependent samples of the base population of 190 students. The ratio of the percent of type in the categories to the percent of type in the total group is reported with the symbol "I". When "I" equals one, the cell has the number of people expected based on the number in the base population. No significant ratios were reported in the tables, therefore, a relationship between personality type and progression could not be established.

To compare this sample with a comparable group from the profession, a table of nursing students from two-year programs (N 1345)

was used as the base population in the SRTT program (McCaulley, 1981). The ENTP group is under represented, I-0.39, (X^2-6.6, df 1, p-.01). The groups that had significant over represented are ESTJ, I-1.69 (X^2 3.8, df 1, p-.05) and ENTJ, I-2.36, (X^2-6.6, df 1, p-.05) (Table 4, Appendix B).

Question 5: What is the relationship between personality type and achievement on the NCLEX-RN?

The SRTT program was used to analyze the relationship between the graduates who passed the NCLEX-RN examination and the 21 who failed. The two categories were run as dependent samples of the base of 169 graduates. The ratios of percent of type in each category to the percent of those from the total population of graduates were not significant. Thus, there is no relationship between personality type and achievement on the NCLEX-RN (Tables 5 and 6, Appendix B).

The graduates in this study were compared with a base population (N-2.351) of "Registered Nurses" (McCaully, 1981). The type that was under represented was ENTP, I-0.42,(X^2-6.6, df 1, p-.01). The types that were over represented all have X^2-3.8,df 1,p-.05 ;included are ESFP, I-1.97; ESTJ, I-1.71; and ENFJ, I-1.65 (Table 7, Appendix B).

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

This chapter presents an overview of the research and discussion of the characteristics of the population of the study. Also included are implications for nursing education and recommendation for future studies.

Overview of the Study

The purpose of the study was to examine the students who enrolled in nursing to determine whether or not there had been a decline in academic ability. Personality type and academic variables (GPA, credit hours, and reading scores) were related to the students' progression (withdrew, failed courses or completed) in the program and their performance on NCLEX-RN.

The program retention is reflected in the progression category "withdrew". The rate of 96% reflects the suggestion by Rosenfeld (1988), that nursing has a high net retention rate. Only 7% of the students who were admitted failed the nursing courses. This low failure rate seemed to indicate the students who were admitted had the academic preparation that enabled them to complete the program. This program's average pass rate (87.5%) on NCLEX-RN was above the national average for 1988 (83.7%) and 1989 (86.5%), the two years of the study using the new standards. The national pass rate prior to the change in standards average about 90%.

The demographics present information that may warrant future study. The findings on minority students show only one-third of them persist from admission to licensure. This problem has been presented in research by Boyle, (1986) and ANA ("Facts", 1987), but the percentage of

those students who failed to achieve licensure is much larger in this study. This indicates that the program has need to develop strategies to enhance achievement for the minority students. The Hodgkinsons' (1985) prediction, that the enrollment of students with diverse ethnic and linguistic backgrounds will increase, could have an impact on retention and pass rates for this program.

The mean age of admission (30.54 years, SD 7.45) is consistent with Rosenfeld (1989), who reported ADN students as older than the traditional first-year college students. With these nontraditional, adult students, selection of the TABE as an assessment of entry skills was an appropriate choice.

The seven classes which comprise the population presented an interesting picture of academic achievement. The literature focus was directed toward the 1988 examination which applied to the class admitted in 1987. That class had a pass rate of 89.3%, which was above the national rate of 83.6%. The following year the class had the highest mean GPA of 3.368, the most withdrawals and course failures, and a pass rate down 7.5 points from the previous year. The 1983 class had the lowest mean GPA of 2.907 and a pass rate of 88.9%. In general terms, the mean GPA's increased every year since 1983 with only an .08 drop in 1987. This does not show the decline in ability reported by National Council of State Boards of Nursing.

The entry GPA was found to be significant in identifying the differences in academic ability in the categories for both the progression and NCLEX-RN variables. Additional information associated with GPA shows seventy-seven percent of the students who failed courses had a GPA between 2.0 and 3.0.

Of the students who failed NCLEX-RN, 61% had a GPA below 3.0; two students who failed had a GPA above 3.7. No evidence in this study targets the need to consider changing the GPA admission requirement for the program.

Based on statistical analysis, the differences in the groups determined from the credit hours were not remarkable. Twenty-eight percent of the students admitted had earned between 50-59 credit hours. The program requires 70 credit hours to obtain a degree. A study by Allen, Higgs, Holloway (1988), and one by Milliken (1986), indicated there was a higher program failure rate with increased credit hours. Their findings did not appear to be supported by this study since the 92% of those who failed courses had total credit hours below the mean of 74.4. This factor may have been influenced by the program's career mobility structure which only admits students who have completed a program of practical nursing. Since 75% of the students who withdrew had 60 or more credit hours, it appeared they had met the minimum requirements, had demonstrated competency at the post-secondary level, and must have withdrawn for reasons other than lack of competence.

The analysis of the reading scores was not significant on the progression variable, but it was significant on the NCLEX-RN achievement variable. None of the students who failed courses had reading scores below 11.0; sixty-nine percent had the highest level of 12.9. An interesting contrast is presented by those who failed NCLEX-RN. Five of those who failed scored below 11.0; however, nine students who failed had the highest reading level of 12.9. There were only three students who scored below 10, those three failed the NCLEX-RN. Students with low reading scores may be successful in courses because they enhance their

learning from the verbal exchange in the classroom, but the lack of reading skill may be a factor contributing to failure on the licensing examination.

The admission criteria requires students to have a minimum reading score of 9.0. This study provides some evidence that the minimum requirement could be raised to 10.0 since students below that level failed NCLEX-RN.

The presentation of personality type in this population was unusual in two areas when compared with a Selection Ratio Type Table (SRTT) using a base population of 1,345 two-year nursing students. The ENFP's were under represented, the ESTJ's and ENTJ's were over represented. The ENTJ's may have a tendency to strive for a goal and neglect the personal elements since feeling is their least developed preference. They are not a type that is usually attracted to nursing, but there was only one withdrawal from that group.

The projections by McCaulley (1985), associating GPA with type, hold for this study. Those with a preference for introversion, intuition, and judgment had the higher GPA's, as did those with the thinking preference. Of the 11 students with GPA's of 4.0, only three had a preference for perception.

In this study 75% of those who withdrew had a preference for introversion; 42% of those who completed were introverts. In the Provost (1985) study 38% of those who persisted were introverts. Batten (1982) reported an 89.2% retention rate for feeling types which is similar in this study at 95%.

An association of type and reading was done by O'Hear (1989), who reported college seniors used different strategies for reading. This

suggests a distinction in the way various personality types approach the written word. O'Hear (1989),reported sensing-judging (SJ) types are detail readers, whereas the intuitive-feeling (NF) types skim the material. There was a contrast in the NCLEX-RN pass rate for those types in this study: 17% of the SJ's failed in comparison to 7% of the NF's.

There were nine males in the study. Six of them have extraverted sensing judging (ESJ) preferences which probably project as decisive, confident behavior. None of the males withdrew or failed courses, but three (33%) of them had GPAs below 2.8 and they failed NCLEX-RN. Perhaps their decisive confident manner drew premature affirmation from others, therefore, they did not recognize their need for more in-depth study. Further investigation may reveal that instructors need to develop strategies to enhance the ESJ types thought processes.

The main value of the MBTI in an ADN program would appear to be as an advisement tool. Students need to be aware that "different is not less", but they may need to depend on their less developed functions to be successful in some of the curriculum components. Acknowledging this allows them to develop adaptation strategies to help them succeed.

The retrospective design of this study limited the options for expanding or manipulating the variables. The study represents the total population of the program, therefore the numbers could not be increased. Because of this, perhaps qualitative methodology could be used in future research to study unexplained variances.

Implications for Future Studies

There are some unusual outcomes in the results that warrant additional study. For instance, 10 of the 21 students lost through

attrition were the sensing feeling types who are attracted to nursing. Further study, that focused on those 10 individuals, could identify common factors which might be addressed to promote their retention.

Looking at the group that failed NCLEX-RN it is evident that 71% of the group had sensing-judging preferences. Characteristic problem solving for these types would flow from their past experience. A case study approach of the students may provide information on the types of clinical experience they had, the strategies they use for test taking, or modification of teaching/learning techniques to enable their success.

Summary

Findings of this study indicated the academic ability of students is not declining. The entry GPA was a significant indicator of differences in the groups that withdrew, failed courses or completed the degree (progression). The entry GPA and reading scores were significant indicators of differences in the pass/fail categories of the NCLEX-RN. The results on personality type supported the MBTI theory when associated with GPA, retention and career selection, but did not contribute to differences in progression or NCLEX-RN achievement.

APPENDIX A

TABLE 2

Demographics: Age, gender

Description of Students by Progression Categories

Age

Categories:	Withdrew N	Withdrew %*	Fail N	Fail %*	Complete N	Complete %*	Total N	Total %*
24 or below	1	12.5	6	46.2	36	21.0	43	22.63
25-29	4	50.0	3	23.0	47	27.8	54	28.42
30-34	3	37.5	1	7.6	34	20.1	38	20.00
35-39	0	0.0	1	7.6	30	17.8	31	16.31
40-44	0	0.0	2	15.4	15	8.8	17	8.95
45-49	0	0.0	0	0.0	5	2.9	5	2.63
50-54	0	0.0	0	0.0	1	0.6	1	0.53
55-above	0	0.0	0	0.0	1	0.6	1	0.53
Totals	8		13		169		190	100.0%

*percent is of the column

Gender

Categories:	Withdrew N	Withdrew %	Fail N	Fail %	Complete N	Complete %	Total N	Total %
male	0	0.0	0	0.0	9	4.7	9	4.7
female	8	4.2	13	6.8	160	84.2	181	95.3
Totals	8	4.2%	13	6.8%	169	88.9%	190	100.0%

TABLE 3

Demographics: Age, gender

Description of graduates by NCLEX-RN achievement

Age

	Fail		Pass		Total	
Categories:	N	%*	N	%*	N	%*
24 or below	7	33.3	29	19.6	36	21.30
25-29	4	19.0	43	29.1	47	27.81
30-34	6	28.6	28	18.9	34	20.11
35-39	4	19.0	26	17.6	30	17.75
40-44	0	0.0	15	10.1	15	8.87
45-49	0	0.0	5	3.4	5	2.96
50-54	0	0.0	1	0.7	1	0.60
55-above	0	0.0	1	0.7	1	0.60
Totals	21		148		169	100.0%

*percent is of the column

Gender

	Fail		Pass		Total	
Categories:	N	%*	N	%*	N	%**
male	3	33.3	6	66.7	9	5.3
female	18	11.3	142	88.8	160	94.7
Totals	21		148		169	100.0%

*percentage is of the row; **percentage is of the column

TABLE 4

Demographics: Description of students by ethnicity

Progression Categories

Categories:	Withdrew N	Withdrew %*	Fail N	Fail %*	Complete N	Complete %*	Total N	Total %**
anglo	7	4.4	10	6.3	142	89.3	159	83.7
black	1	5.6	1	5.6	16	88.9	18	9.5
hispanic	0	0.0	1	11.1	8	88.9	9	4.7
other#	0	0.0	1	25.0	3	75.0	4	2.1
Totals	8		13		169		190	100.0%

*percent is of the row; **percent is of the column.

NCLEX-RN Achievement

Categories:	Fail N	Fail %*	Pass N	Pass %*	Total N	Total %**
anglo	11	7.8	131	92.3	142	84.2
black	3	18.8	13	81.2	16	9.5
hispanics	5	62.5	3	37.5	8	4.7
other#	2	66.0%	1	33.3	3	1.8
Totals	21		148		169	100.0%

#other-2 Iranians, 1 Brazilan, 1 Micronesian
*percent is of the row; **percent is the column.

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TABLE 5

Classes of students for 1982-1988

	Progression Categories						
	Withdrew		Fail		Complete		Total
Admission Date	N	%	N	%	N	%	N
1982	0	0	2	9.5%	19	91%	21
1983	0	0	2	10%	18	90%	20
1984	2	8%	0	0	23	92%	25
1985	1	3%	2	7%	28	90%	31
1986	0	0	0	0	31	100%	31
1987*	2	6%	2	6%	28	88%	32
1988*	3	10%	5	17%	22	73%	30
	8		13		169		190

	NCLEX-RN Achievement				
	Pass		Fail		Total
Date	N	%	N	%	N
1982	17	89.5	2	10.5	19
1983	16	88.9	2	11.1	18
1984	18	78.3	5	21.7	23
1985	25	89.3	3	10.7	28
1986	29	93.6	2	6.5	31
1987*	25	89.3	3	10.7	28
1988*	18	81.8	4	18.2	22
	148		21		169

*The year of NCLEX-RN change in scoring method.

TABLE 6

Mean Scores of Independent Variables by Classes

Admission Date	EGPA		CRHR		Read	
	mean	sd	mean	sd	mean	sd
1982	3.024	0.558	74.57	38.505	12.66	0.358
1983	2.907	0.380	72.20	32.552	12.34	0.737
1984	3.18[illegible]	0.549	76.70	24.453	12.50	1.017
1985	3.255	0.524	77.52	36.335	12.68	0.485
1986	3.360	0.458	72.19	34.404	12.39	0.[illegible]32
1987*	3.281	0.526	77.13	38.272	12.58	0.576
1988*	3.368	0.419	70.00	26.841	12.37	0.935

*The year of NCLEX-RN change in scoring method.

TABLE 7

Personality Type: Progression Categories

Types	Withdrew		Failed		Completed		Total	Percent of group
	N	%*	N	%*	N	%*		
ISTJ	1	5.6	1	5.6	16	88.9	18	9.47
ISFJ	2	6.3	1	3.1	29	90.6	32	16.84
INFJ	1	14.3	0	0.0	6	85.7	7	3.68
INTJ	0	0.0	0	0.0	1	100.0	1	0.53
ISTP	0	0.0	0	0.0	4	100.0	4	2.11
ISFP	1	12.5	0	0.0	7	87.5	8	4.21
INFP	1	11.1	1	11.1	7	77.8	9	4.74
INTP	0	0.0	0	0.0	2	100.0	2	1.05
ESTP	0	0.0	0	0.0	3	100.0	3	1.58
ESFP	0	0.0	2	13.33	13	86.7	15	7.89
ENFP	0	0.0	1	11.10	8	88.9	9	4.74
ENTP	0	0.0	0	0.0	3	100.0	3	1.58
ESTJ	0	0.0	2	13.6	20	86.4	22	11.58
ESFJ	1	3.5	3	10.3	23	86.2	29	15.26
ENFJ	0	0.0	1	5.3	18	94.7	19	10.00
ENTJ	1	11.1	0	0.0	8	88.9	9	4.74
Total	8	4.21	13	6.86	169	88.9	190	100.0%

*percentage in the categories represents the row and type.

TABLE 8

Personality Type: NCLEX-RN Achivement

Types	Passed		Failed		Total	Percent of group
	N	%*	N	%*	N	%
ISTJ	15	93.8	1	6.2	16	9.47
ISFJ	24	82.8	5	17.2	29	17.16
INFJ	6	100.0	0	0.0	6	3.55
INTJ	1	100.0	0	0.0	1	0.59
ISTP	3	100.0	0	0.0	3	1.78
ISFP	6	85.7	1	14.3	7	4.14
INFP	7	100.0	0	0.0	7	4.14
INTP	2	100.0	0	0.0	2	1.18
ESTP	4	100.0	0	0.0	4	2.37
ESFP	12	92.3	1	7.7	13	7.69
ENFP	7	87.5	1	12.5	8	4.73
ENTP	2	66.7	1	33.3	3	1.78
ESTJ	16	80.0	4	20.0	20	11.83
ESFJ	19	79.2	3	20.8	24	14.20
ENFJ	16	88.9	2	11.1	18	10.65
ENTJ	8	100.0	0	0.0	8	4.73
	148		21		169	100%

*Percentages in the categories represent the row and type.

TABLE 9

Summary of Variable

Progression	NCLEX-RN
EGPA	EGPA
X^2=10.256, df 2, p=.0059*	X^2=10.950, df 1, p=.0009*
CRHR	CRHR
X^2=4.0268, df 2, p=.1335	X^2=1.0117, df 1, p=.3145
READ	READ
X^2=1.1410, df 2, p=.5653	X^2=24.014, df 1, p=.0001*

*Significant at $p < .05$

TABLE 10

Independent Variables: Entry grade point average (EGPA)
Students by Progression Categories

	Entry grade-point average							
	Withdraw		Fail		Complete		Total	
Categories	N	%*	N	%*	N	%*	N	%**
2.0-2.499	0	0.0	3	23.1	13	7.7	16	8.42
2.5-2.999	3	37.5	7	53.9	41	24.3	51	26.8
3.0-3.499	2	25.0	2	15.4	53	31.4	57	30.0
3.5-3.999	2	25.0	1	7.7	51	30.2	54	28.4
4.0	1	12.5	0	0.0	11	6.5	12	6.3
Totals	8		13		169		190	100.0%

*percent is for the column.
**percent of group.

TABLE 11

Independent Variables: Prior credit hours (CRHR)
Students by Progression Categories

	Prior Credit Hours							
	Withdraw		Fail		Complete		Total	
Categories	N	%*	N	%*	N	%*	N	%**
19 or below	0	0.0	1	7.69	1	0.6	2	1.1
20-29	0	0.0	1	7.69	0	0.0	1	0.5
30-39	1	12.5	0	0.00	2	1.2	3	1.6
40-49	0	0.0	1	7.69	21	12.4	22	11.6
50-59	1	12.5	5	38.46	48	28.4	54	28.4
60-69	3	37.5	4	30.77	21	12.4	28	14.7
70-79	1	12.5	0	0.00	20	11.8	21	11.1
80-89	0	0.0	0	0.00	11	6.5	11	5.8
90-99	2	25.0	1	7.69	15	8.9	18	9.5
100-149	0	0.0	0	0.00	21	12.4	21	11.1
150-199	0	0.0	0	0.00	8	4.7	8	4.2
over 200	0	0.0	0	0.00	1	0.6	1	0.5
Totals	8		13		169		190	100.0%

*percent is for the column
**percent of group.

TABLE 12

Independent Variable: TABE reading score (READ)
Students by Progression Categories

TABE reading scores

Categories	Withdraw N	Withdraw %*	Fail N	Fail %*	Complete N	Complete %*	Total N	Total %**
09.0-09.4	0	0.0	0	0.0	2	1.2	2	1.05
09.5-09.9	0	0.0	0	0.0	1	0.6	1	0.53
10.0-10.4	0	0.0	0	0.0	2	1.2	2	1.05
10.5-10.9	0	0.0	0	0.0	5	3.0	5	2.60
11.0-11.4	0	0.0	2	15.4	9	5.33	11	5.80
11.5-11.9	0	0.0	0	0.0	9	5.33	9	4.70
12.0-12.4	1	12.5	2	15.4	16	9.50	19	10.00
12.5-12.9	7	87.5	9	69.2	125	74.00	141	74.21
Totals	8		13		169		190	100.00%

*percent is for the column.
**percent is for the group.

TABLE 13

Independent Variable: EGPA
Graduates by NCLEX-RN achievement

	Entry grade-point average					
	Fail		Pass		Total	
Categories	N	%*	N	%*	N	%*
1.0-2.499	2	9.5	11	7.4	13	7.7
2.5-2.999	11	52.4	30	20.3	41	24.3
3.0-3.499	6	28.6	47	31.8	53	31.4
3.5-3.999	2	9.5	49	33.1	51	30.2
4.0	0	0.0	4	7.4	11	6.5
Totals	21		148		169	100.0%

*percent is of the row; **percent is of the group.

Table 14

Independent Variable: CRHR
Graduates by NCLEX-RN achievement

	Prior Credit Hour					
	Fail		Pass		Total	
Categories	N	%*	N	%*	N	%**
19 or below	0	0.0	1	0.7	1	0.6
20-29	0	0.0	0	0.0	0	0.0
30-39	0	0.0	2	1.4	2	1.2
40-49	1	4.8	20	13.5	21	12.4
50-59	4	19.1	44	29.7	48	28.4
60-69	4	19.1	17	11.5	21	12.4
70-79	5	23.8	15	10.1	20	11.8
80-89	2	9.5	9	6.1	11	6.5
90-99	3	14.3	13	8.8	16	9.5
100-149	2	9.5	18	12.2	20	11.8
150-199	0	0.0	8	5.4	8	4.7
over-200	0	0.0	1	0.7	1	0.6
Totals	21		148		169	100.0

*percent is of the column; ** percent is of the group.

TABLE 15

Independent Variable: READ
Graduates by NCLEX-RN achievement

TABE reading scores

Categories	Fail N	Fail %*	Pass N	Pass %*	Total N	Total %**
09.0-09.4	2	9.5	0	0.0	2	1.2
09.5-09.9	1	4.8	0	0.0	1	0.6
10.0-10.4	1	4.8	1	0.7	2	1.2
10.5-10.9	1	4.8	4	2.7	5	3.0
11.0-11.4	3	14.3	6	4.05	9	5.3
11.5-11.9	1	4.8	8	5.4	9	5.3
12.0-12.4	3	14.3	13	8.8	16	9.5
12.5-12.9	9	42.9	116	78.4	125	74.0
Totals	21		148		169	100.0%

*percent is of the column, **percent is of the group.

TABLE 16

Personality Preference by grade-point average

	Grade-Point Average Group						
Preference	Below 2.0	2.0-2.499	2.5-2.999	3.0-3.499	3.5-3.999	4.0	Total
Extraversion	0	9	32	31	29	8	109
Introversion	0	7	19	26	25	4	81
Sensing	0	11	38	39	34	9	131
Intuitive	0	5	13	18	20	3	59
Thinking	0	7	12	18	24	1	62
Feeling	0	6	39	39	30	11	128
Judging	0	13	35	41	40	10	139
Perception	0	3	16	16	14	2	51

For the TF dichotomy X^2=9.501, df 4, p=.05.

TABLE 17

Progression Categories: Analysis of Independent Variables

Entry grade point averages (EGPA)

Categories:	N	Mean	sd
All	190	3.219	0.51
Withdrew	8	3.244	0.50
Failed	13	2.776	0.40
Completed	169	3.252	0.50

Prior Credit hours (CRHR)

Categories:	N	Mean	sd
All	190	74.405	33.09
Withdrew	8	66.00	19.13
Failed	13	54.46	18.94
Completed	169	76.34	33.97

TABE reading scores (READ)

Categories	N	Mean	sd
All	190	12.507	0.75
Withdrew	8	12.763	0.32
Failed	13	12.477	0.67
Completed	169	12.497	0.77

TABLE 18

NCLEX-RN Achievement: Analysis of Independent Variable

Entry grade point average (EGPA)

Categories:	N	Mean	Sd
All	169	3.252	0.50
Pass	148	3.301	0.50
Fail	21	2.913	0.42

Prior credit hours (CRHR)

Categories:	N	Mean	Sd
All	169	76.337	33.97
Pass	148	76.432	35.50
Fail	21	75.667	20.68

TABE reading score (READ)

Categories:	N	Mean	Sd
All	169	12.497	0.770
Pass	148	12.605	0.605
Fail	21	11.733	1.265

APPENDIX B

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UNM MASTERS THESIS
NOVEMBER, 1990

Group tabulated:

TABLE 1

ADN NURSING STUDENTS
"withdrew"

N = 8

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type. I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING	SENSING types with FEELING	INTUITIVE types with FEELING	INTUITIVE types with THINKING
ISTJ	ISFJ	INFJ	INTJ
N= 1	N= 2	N= 1	N= 0
%= 12.50	%= 25.00	%= 12.50	%= 0.00
I= 1.32	I= 1.48	I= 3.39	I= 0.00
ISTP	ISFP	INFP	INTP
N= 0	N= 1	N= 1	N= 0
%= 0.00	%= 12.50	%= 12.50	%= 0.00
I= 0.00	I= 2.97	I= 2.64	I= 0.00
ESTP	ESFP	ENFP	ENTP
N= 0	N= 0	N= 0	N= 0
%= 0.00	%= 0.00	%= 0.00	%= 0.00
I= 0.00	I= 0.00	I= 0.00	I= 0.00
ESTJ	ESFJ	ENFJ	ENTJ
N= 0	N= 1	N= 0	N= 1
%= 0.00	%= 12.50	%= 0.00	%= 12.50
I= 0.00	I= 0.82	I= 0.00	I= 2.64

			N	%	I
J		E	2	25.00	0.44
U		I	6	75.00	1.76
D	I	S	5	62.50	0.91
G	N	N	3	37.50	1.21
I	T	T	2	25.00	0.77
N	R	F	6	75.00	1.11
G	O	J	6	75.00	1.04
	V	P	2	25.00	0.90
P	E	IJ	4	50.00	1.64
E	R	IP	2	25.00	2.07
R	T	EP	0	0.00	0.00
C	S	EJ	2	25.00	0.60
E		ST	1	12.50	0.51
P		SF	4	50.00	1.13
T		NF	2	25.00	1.08
I	E	NT	1	12.50	1.58
V	X	SJ	4	50.00	0.94
E	T	SP	1	12.50	0.79
S	R	NP	1	12.50	1.03
	A	NJ	2	25.00	1.32
J	V	TJ	2	25.00	0.95
U	E	TP	0	0.00	0.00
D	R	FP	2	25.00	1.16
G	T	FJ	4	50.00	1.09
I	S	IN	2	25.00	2.50
N		EN	1	12.50	0.59
G		IS	4	50.00	1.53
		ES	1	12.50	0.34

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
ADN STUDENTS PROGRESSION VARIABLE CLASSES 1982-1988
Base total N = 190. Sample and base are dependent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.0745	IJ	0.2502	SJ	1.0000	IN 0.1844
1.0000	0.6240	0.2637	1.0000	I	0.0745	IP	0.2500	SP	1.0000	EN 0.6926
				S	0.7052	EP	0.3603	NP	1.0000	IS 0.4415
1.0000	0.2959	0.3268	1.0000	N	0.7052	EJ	0.4726	NJ	1.0000	ES 0.2619
				T	0.7242	ST	0.6818	TJ	1.0000	
1.0000	0.6348	1.0000	1.0000	F	0.7242	SF	1.0000	TP	0.6703	
				J	1.0000	NF	1.0000	FP	1.0000	
0.5996	1.0000	0.6077	0.3268	P	1.0000	NT	1.0000	FJ	1.0000	

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UMN MASTERS THESIS
November, 1990

Group tabulated:

TABLE 2

ADN NURSING STUDENTS
"failed"

N = 13

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type.
I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING	SENSING types with FEELING	INTUITIVE types with FEELING	INTUITIVE types with THINKING
ISTJ	ISFJ	INFJ	INTJ
N= 1	N= 1	N= 0	N= 0
%= 7.69	%= 7.69	%= 0.00	%= 0.00
I= 0.81	I= 0.46	I= 0.00	I= 0.00
ISTP	ISFP	INFP	INTP
N= 0	N= 0	N= 1	N= 0
%= 0.00	%= 0.00	%= 7.69	%= 0.00
I= 0.00	I= 0.00	I= 1.62	I= 0.00
ESTP	ESFP	ENFP	ENTP
N= 0	N= 2	N= 1	N= 0
%= 0.00	%= 15.38	%= 7.69	%= 0.00
I= 0.00	I= 1.95	I= 1.62	I= 0.00
ESTJ	ESFJ	ENFJ	ENTJ
N= 2	N= 4	N= 1	N= 0
%= 15.38	%= 30.77	%= 7.69	%= 0.00
I= 1.33	I= 2.02	I= 0.77	I= 0.00

		N	%	I
J	E	10	76.92	1.34
U	I	3	23.08	0.54
D I	S	10	76.92	1.12
G N	N	3	23.08	0.74
I T	T	3	23.08	0.71
N R	F	10	76.92	1.14
G O	J	9	69.23	0.96
V	P	4	30.77	1.10
P E	IJ	2	15.38	0.50
E R	IP	1	7.69	0.64
R T	EP	3	23.08	1.46
C S	EJ	7	53.85	1.30
E	ST	3	23.08	0.93
P	SF	7	53.85	1.22
T	NF	3	23.08	1.00
I E	NT	0	0.00	0.00
V X	SJ	8	61.54	1.16
E T	SP	2	15.38	0.97
S R	NP	2	15.38	1.27
A	NJ	1	7.69	0.41
J V	TJ	3	23.08	0.88
U E	TP	0	0.00	0.00
D R	FP	4	30.77	1.43
G T	FJ	6	46.15	1.01
I S	IN	1	7.69	0.77
N	EN	2	15.38	0.73
G	IS	2	15.38	0.47
	ES	8	61.54	1.69

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
ADN STUDENTS PROGRESSION VARIABLE CLASSES 1982-1988
Base total N = 190. Sample and base are dependent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.1596	IJ	0.3504	SJ	0.5780	IN 1.0000
1.0000	0.4763	1.0000	1.0000	I	0.1596	IP	0.7126	SP	1.0000	EN 0.7396
				S	0.5624	EP	0.6960	NP	1.0000	IS 0.2277
1.0000	0.6568	1.0000	1.0000	N	0.5624	EJ	0.8645	NJ	0.4681	ES 0.0712
				T	0.5519	ST	1.0000	TJ	1.0000	
1.0000	0.6042	1.0000	1.0000	F	0.5519	SF	0.5253	TP	0.6091	
				J	1.0000	NF	1.0000	FP	0.4829	
1.0000	0.1166	1.0000	0.6394	P	1.0000	NT	0.4014	FJ	0.0007	

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UNM MASTERS THESIS
November, 1990

Group tabulated:

TABLE 3

ADN NURSING STUDENTS
"completed"

N = 169

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type. I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING	SENSING types with FEELING	INTUITIVE types with FEELING	INTUITIVE types with THINKING
ISTJ	ISFJ	INFJ	INTJ
N= 16	N= 29	N= 6	N= 1
%= 9.47	%= 17.16	%= 3.55	%= 0.59
I= 1.00	I= 1.02	I= 0.96	I= 1.12
ISTP	ISFP	INFP	INTP
N= 4	N= 7	N= 7	N= 2
%= 2.37	%= 4.14	%= 4.14	%= 1.18
I= 1.12	I= 0.98	I= 0.87	I= 1.12
ESTP	ESFP	ENFP	ENTP
N= 3	N= 13	N= 8	N= 3
%= 1.78	%= 7.69	%= 4.73	%= 1.78
I= 1.12	I= 0.97	I= 1.00	I= 1.12
ESTJ	ESFJ	ENFJ	ENTJ
N= 20	N= 24	N= 18	N= 8
%= 11.83	%= 14.20	%= 10.65	%= 4.73
I= 1.02	I= 0.93	I= 1.07	I= 1.00

		N	%	I
J	E	97	57.40	1.00
U	I	72	42.60	1.00
D I	S	116	68.64	1.00
G N	N	53	31.36	1.01
I T	T	57	33.73	1.03
N R	F	112	66.27	0.98
G O	J	122	72.19	1.00
V	P	47	27.81	1.00
P E	IJ	52	30.77	1.01
E R	IP	20	11.83	0.98
R T	EP	27	15.98	1.01
C S	EJ	70	41.42	1.00
E	ST	43	25.44	1.03
P	SF	73	43.20	0.98
T	NF	39	23.08	1.00
I E	NT	14	8.28	1.05
V X	SJ	89	52.66	0.99
E T	SP	27	15.98	1.01
S R	NP	20	11.83	0.98
A	NJ	33	19.53	1.03
J V	TJ	45	26.63	1.01
U E	TP	12	7.10	1.12
D R	FP	35	20.71	0.96
G T	FJ	77	45.56	1.00
I S	IN	16	9.47	0.95
N	EN	37	21.89	1.04
G	IS	56	33.14	1.02
	ES	60	35.50	0.98

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
ADN STUDENTS PROGRESSION VARIABLES CLASSES 1982-1988
Base total N = 190. Sample and base are dependent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.0005	IJ	0.0425	SJ	0.1506	IN 0.7003
1.0000	0.7776	1.0000	1.0000	I	0.0005	IP	1.0000	SP	1.0000	EN 0.5745
				S	0.0679	EP	1.0000	NP	1.0000	IS 0.1770
1.0000	1.0000	0.2606	1.0000	N	0.0679	EJ	0.0159	NJ	0.7700	ES 0.4368
				T	0.4630	ST	0.6037	TJ	0.8042	
1.0000	1.0000	1.0000	1.0000	F	0.4630	SF	0.6390	TP	0.3674	
				J	0.0054	NF	1.0000	FP	0.6822	
1.0000	0.3292	0.4893	1.0000	P	0.0054	NT	0.7073	FJ	0.0318	

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UNM MASTERS THESIS
November, 1990

Group tabulated:

TABLE 4

ADN NURSING STUDENTS
"total sample"

N = 190

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type.
I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING	SENSING types with FEELING	INTUITIVE types with FEELING	INTUITIVE types with THINKING
ISTJ	ISFJ	INFJ	INTJ
N= 18	N= 32	N= 7	N= 1
%= 9.47	%= 16.84	%= 3.68	%= 0.53
I= 1.54	I= 1.24	I= 1.08	I= 0.42
ISTP	ISFP	INFP	INTP
N= 4	N= 8	N= 9	N= 2
%= 2.11	%= 4.21	%= 4.74	%= 1.05
I= 1.29	I= 0.64	I= 0.57	I= 0.49
ESTP	ESFP	ENFP #	ENTP
N= 3	N= 15	N= 9	N= 3
%= 1.58	%= 7.89	%= 4.74	%= 1.58
I= 0.79	I= 1.03	I= 0.39	I= 0.62
ESTJ "	ESFJ	ENFJ	ENTJ "
N= 22	N= 29	N= 19	N= 9
%= 11.58	%= 15.26	%= 10.00	%= 4.74
I= 1.69	I= 0.94	I= 1.31	I= 2.36

			N	%	I	
J		E	109	57.37	1.01	
U		I	81	42.63	0.99	
D	I	S	131	68.95	1.14	"
G	N	N	59	31.05	0.79	"
I	T	T	62	32.63	1.33	"
N	R	F	128	67.37	0.89	"
G	O	J	137	72.11	1.26	*
	V	P	53	27.89	0.65	*
P	E	IJ	58	30.53	1.25	
E	R	IP	23	12.11	0.65	"
R	T	EP	30	15.79	0.65	#
C	S	EJ	79	41.58	1.27	"
E		ST	47	24.74	1.49	#
P		SF	84	44.21	1.00	
T		NF	44	23.16	0.74	"
I	E	NT	15	7.89	0.99	
V	X	SJ	101	53.16	1.24	#
E	T	SP	30	15.79	0.88	
S	R	NP	23	12.11	0.48	*
	A	NJ	36	18.95	1.32	
J	V	TJ	50	26.32	1.62	*
U	E	TP	12	6.32	0.76	
D	R	FP	41	21.58	0.63	*
G	T	FJ	87	45.79	1.12	
I	S	IN	19	10.00	0.66	
N		EN	40	21.05	0.87	
G		IS	62	32.63	1.17	
		ES	69	36.32	1.11	

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
McCaulley's table 1977 NURSING STUDENTS 2-YEAR PROGRAMS
Base total N = 1345. Sample and base are independent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.0080	IJ	3.3340	SJ	7.2099	IN 3.4906
2.9542	1.5207	0.0348	0.5010	I	0.0080	IP	4.7840	SP	0.4847	EN 0.9302
				S	4.8276	EP	6.6707	NP	15.4047	IS 1.8450
0.7621	1.5445	2.8558	0.4169	N	4.8276	EJ	5.7435	NJ	2.7729	ES 0.9338
				T	5.6245	ST	7.4811	TJ	11.5953	
0.7907	0.0131	8.9814	0.4727	F	5.6245	SF	0.0026	TP	0.9070	
				J	15.3446	NF	5.3175	FP	12.5871	
5.4378	0.1277	1.2481	5.4152	P	15.3446	NT	0.0008	FJ	1.6447	

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UNM MASTERS THESIS
November, 1990

Group tabulated:

TABLE 5

ADN NURSING STUDENTS
"passed NCLEX-RN"

N = 148

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type.
I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING	SENSING types with FEELING	INTUITIVE types with FEELING	INTUITIVE types with THINKING
ISTJ N= 15 %= 10.14 I= 1.07	ISFJ N= 24 %= 16.22 I= 0.95	INFJ N= 6 %= 4.05 I= 1.14	INTJ N= 1 %= 0.68 I= 1.14
ISTP N= 4 %= 2.70 I= 1.14	ISFP N= 6 %= 4.05 I= 0.98	INFP N= 7 %= 4.73 I= 1.14	INTP N= 2 %= 1.35 I= 1.14
ESTP N= 3 %= 2.03 I= 1.14	ESFP N= 12 %= 8.11 I= 1.05	ENFP N= 7 %= 4.73 I= 1.00	ENTP N= 2 %= 1.35 I= 0.76
ESTJ N= 16 %= 10.81 I= 0.91	ESFJ N= 19 %= 12.84 I= 0.90	ENFJ N= 16 %= 10.81 I= 1.02	ENTJ N= 8 %= 5.41 I= 1.14

			N	%	I
J		E	83	56.08	0.98
U		I	65	43.92	1.03
D	I	S	99	66.89	0.97
G	N	N	49	33.11	1.06
I	T	T	51	34.46	1.02
N	R	F	97	65.54	0.99
G	O	J	105	70.95	0.98
	V	P	43	29.05	1.04
P	E	IJ	46	31.08	1.01
E	R	IP	19	12.84	1.08
R	T	EP	24	16.22	1.02
C	S	EJ	59	39.86	0.96
E		ST	38	25.68	1.01
P		SF	61	41.22	0.95
T		NF	36	24.32	1.05
I	E	NT	13	8.78	1.06
V	X	SJ	74	50.00	0.95
E	T	SP	25	16.89	1.06
S	R	NP	18	12.16	1.03
	A	NJ	31	20.95	1.07
J	V	TJ	40	27.03	1.02
U	E	TP	11	7.43	1.05
D	R	FP	32	21.62	1.04
G	T	FJ	65	43.92	0.96
I	S	IN	16	10.81	1.14
N		EN	33	22.30	1.02
G		IS	49	33.11	1.00
		ES	50	33.78	0.95

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
ADN STUDENTS NCLEX-RN ACHIEVMENT VARIABLE CLASSES 1982-1988
Base total N = 169. Sample and base are dependent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.8427	IJ	0.0544	SJ	3.3875	IN	0.2252
0.6962	0.5356	0.6076	1.0000	I	0.8427	IP	0.4736	SP	0.5338	EN	0.7899
				S	0.2207	EP	1.0000	NP	1.0000	IS	0.0004
1.0000	1.0000	0.5984	1.0000	N	0.2207	EJ	1.1873	NJ	0.2584	ES	1.5373
				T	0.2852	ST	1.0000	TJ	0.8012		
1.0000	0.7076	1.0000	0.3301	F	0.2852	SF	1.9012	TP	1.0000		
				J	0.4400	NF	0.4122	FP	0.5720		
0.2811	0.1864	1.0000	0.5977	P	0.4400	NT	0.7005	FJ	1.2966		

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UNM MASTERS THESIS
November, 1990

Group tabulated:

TABLE 6

ADN NURSING STUDENTS
"failed NCLEX-RN"

N = 21

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type. I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING		SENSING types with FEELING		INTUITIVE types with FEELING		INTUITIVE types with THINKING	
ISTJ		ISFJ		INFJ		INTJ	
N=	1	N=	5	N=	0	N=	0
%=	4.76	%=	23.81	%=	0.00	%=	0.00
I=	0.50	I=	1.39	I=	0.00	I=	0.00
ISTP		ISFP		INFP		INTP	
N=	0	N=	1	N=	0	N=	0
%=	0.00	%=	4.76	%=	0.00	%=	0.00
I=	0.00	I=	1.15	I=	0.00	I=	0.00
ESTP		ESFP		ENFP		ENTP	
N=	0	N=	1	N=	1	N=	1
%=	0.00	%=	4.76	%=	4.76	%=	4.76
I=	0.00	I=	0.62	I=	1.01	I=	2.68
ESTJ		ESFJ		ENFJ		ENTJ	
N=	4	N=	5	N=	2	N=	0
%=	19.05	%=	23.81	%=	9.52	%=	0.00
I=	1.61	I=	1.68	I=	0.89	I=	0.00

			N	%	I
J		E	14	66.67	1.15
U		I	7	33.33	0.79
D	I	S	17	80.95	1.18
G	N	N	4	19.05	0.61
I	T	T	6	28.57	0.85
N	R	F	15	71.43	1.08
G	O	J	17	80.95	1.12
	V	P	4	19.05	0.68
P	E	IJ	6	28.57	0.93
E	R	IP	1	4.76	0.42
R	T	EP	3	14.29	0.86
C	S	EJ	11	52.38	1.26
E		ST	5	23.81	0.94
P		SF	12	57.14	1.32
T		NF	3	14.29	0.62
I	E	NT	1	4.76	0.57
V	X	SJ	15	71.43	1.36
E	T	SP	2	9.52	0.60
S	R	NP	2	9.52	0.80
	A	NJ	2	9.52	0.49
J	V	TJ	5	23.81	0.89
U	E	TP	1	4.76	0.67
D	R	FP	3	14.29	0.69
G	T	FJ	12	57.14	1.25
I	S	IN	0	0.00	0.00
N		EN	4	19.05	0.87
G		IS	7	33.33	1.02
		ES	10	47.62	1.32

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
ADN STUDENTS NCLEX-RN ACHIEVEMENT VARIABLES 1982-1988
Base total N = 169. Sample and base are dependent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.7413	IJ	0.0544	SJ	3.3875	IN	0.2252
0.6962	0.5356	0.6076	1.0000	I	0.7413	IP	0.4734	SP	0.5338	EN	0.7899
				S	0.2207	EP	1.0000	NP	1.0000	IS	0.0068
1.0000	1.0000	0.5984	1.0000	N	0.2207	EJ	1.1873	NJ	0.2584	ES	1.3807
				T	0.2852	ST	1.0000	TJ	0.8012		
1.0000	0.7076	1.0000	0.3301	F	0.2852	SF	1.9012	TP	1.0000		
				J	0.4400	NF	0.4122	FP	0.5720		
0.2811	0.1864	1.0000	0.5977	P	0.4400	NT	0.7005	FJ	1.2966		

Source of data

ENMU-C NURSING PROGRAM
Prepared by IONE WOOD
UNM MASTERS THESIS
November, 1990

Group tabulated:

TABLE 7

ADN NURSING STUDENTS
"graduates"

N = 148

MBTI Type Table
Center for Applications of Psychological Type

Legend: % = percent of total choosing this group who fall into this type.
I = Self-selection index: Ratio of percent of type in group to % in sample.

SENSING types with THINKING		SENSING types with FEELING		INTUITIVE types with FEELING		INTUITIVE types with THINKING	
ISTJ		ISFJ		INFJ		INTJ	
N=	15	N=	24	N=	6	N=	1
%=	10.14	%=	16.22	%=	4.05	%=	0.68
I=	1.07	I=	0.95	I=	1.14	I=	1.14
ISTP		ISFP		INFP		INTP	
N=	4	N=	6	N=	7	N=	2
%=	2.70	%=	4.05	%=	4.73	%=	1.35
I=	1.14	I=	0.98	I=	1.14	I=	1.14
ESTP		ESFP		ENFP		ENTP	
N=	3	N=	12	N=	7	N=	2
%=	2.03	%=	8.11	%=	4.73	%=	1.35
I=	1.14	I=	1.05	I=	1.00	I=	0.76
ESTJ		ESFJ		ENFJ		ENTJ	
N=	16	N=	19	N=	16	N=	8
%=	10.81	%=	12.84	%=	10.81	%=	5.41
I=	0.91	I=	0.90	I=	1.02	I=	1.14

			N	%	I
J		E	83	56.08	0.98
U		I	65	43.92	1.03
D	I	S	99	66.89	0.97
G	N	N	49	33.11	1.06
I	T	T	51	34.46	1.02
N	R	F	97	65.54	0.99
G	O	J	105	70.95	0.98
	V	P	43	29.05	1.04
P	E	IJ	46	31.08	1.01
E	R	IP	19	12.84	1.08
R	T	EP	24	16.22	1.02
C	S	EJ	59	39.86	0.96
E		ST	38	25.68	1.01
P		SF	61	41.22	0.95
T		NF	36	24.32	1.05
I	E	NT	13	8.78	1.06
V	X	SJ	74	50.00	0.95
E	T	SP	25	16.89	1.06
S	R	NP	18	12.16	1.03
	A	NJ	31	20.95	1.07
J	V	TJ	40	27.03	1.02
U	E	TP	11	7.43	1.05
D	R	FP	32	21.62	1.04
G	T	FJ	65	43.92	0.96
I	S	IN	16	10.81	1.14
N		EN	33	22.30	1.02
G		IS	49	33.11	1.00
		ES	50	33.78	0.95

Note concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., Chi-square >3.8;
implies significance at the .01 level, i.e., Chi-square > 6.6;
* implies significance at the .001 level, i.e., Chi-square > 10.8.
_ (underscore) indicates Fisher's exact probability used instead Chi-square.

Base population used in calculating selection ratios:
ADN STUDENTS NCLEX-RN ACHIEVEMENT VARIABLE CLASSES 1982-1988
Base total N = 169. Sample and base are dependent.

* * * * Calculated values of Chi-square or Fisher's exact probability * * * *
Type table order

				E	0.8427	IJ	0.0544	SJ	3.3875	IN	0.2252
0.6962	0.5356	0.6076	1.0000	I	0.8427	IP	0.4736	SP	0.5338	EN	0.7899
				S	0.2207	EP	1.0000	NP	1.0000	IS	0.0004
1.0000	1.0000	0.5984	1.0000	N	0.2207	EJ	1.1873	NJ	0.2584	ES	1.5373
				T	0.2852	ST	1.0000	TJ	0.8012		
1.0000	0.7076	1.0000	0.3301	F	0.2852	SF	1.9012	TP	1.0000		
				J	0.4400	NF	0.4122	FP	0.5720		
0.2811	0.1864	1.0000	0.5977	P	0.4400	NT	0.7005	FJ	1.2966		

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